

### **REMARKS/ARGUMENTS**

Independent claims 36, 51 and 72 have been amended to overcome the prior art rejections by requiring the die be one for preparing pellets, support for which can be found in the specification at paragraph 0017, inter alia. Moreover, these claims now require apparatus capable of heating the die to a temperature "from 30°-170°C above bulk temperature  $T_{\text{melt}}$ ," support for which can be found in the specification at paragraph 0034. Additionally, new claims 73-86 have been added, support for which can be found in the specification at paragraphs 0015, 0065, 0066, 0077, 0099, 0101, and 0103, inter alia. Neither the amendment nor the new claims add any new matter. Entry and consideration of these new and amended claims is respectfully requested in that they are believed to overcome all rejections.

### **35 USC 102 Rejection Of Claims**

Claims 36-39, 51-53, 56, and 72 were finally rejected as anticipated by Hiromi et al. JP Patent No. 58-217327 ("Hiromi"). The Office Action indicates that Hiromi provides all of the features of the independent claims including heaters 2 and 4 proximate the downstream face of an extrusion apparatus.

Applicants respectfully traverse this rejection.

The Hiromi specification and drawings fail to disclose the claimed apparatus for preparing pellets, which apparatus must be capable of heating the die to a temperature from 30°-170°C above bulk temperature  $T_{\text{melt}}$ . Instead, Hiromi discloses an apparatus used only to prepare *hollow* moldings. *See*, Hiromi, title and abstract. In contrast, the present claims are limited to apparatus used to prepare "pellets," which term is recognized in common parlance as describing a *solid* mass. *The American Heritage Dictionary* (1970) describes "pellet" as "[a] small, solid or densely packed ball or mass. . ."

Moreover, Hiromi fails to disclose or suggest an apparatus capable of providing now required temperature differentials between the extruded melt and the locally heated portion of the melt downstream. As earlier noted, Hiromi merely suggests Centigrade temperature ranges indicating a consistent  $T_{\text{melt}}$  temperature typical of extrusions, in this case for a particular polymer, and does not teach or suggest localized heating of a portion of the polymer exiting the

extrusion device.

The Hiromi drawings suggest a large heater 2 inside and close to the extrusion path along with a small heater outside and more removed from the extrusion path. If anything, this suggests an effort to properly maintain the cup temperature of the entire extrusion; certainly it doesn't suggest increased heating on the outer edges which are known to cause the cracking problems addressed by the present invention. Furthermore, this is consistent with the repeated indication of a single temperature range for the melt as given in the Hiromi specification. There is no small number temperature differential range indicated anywhere in the Hiromi specification. Finally, the smaller heater 4 appears quite inadequate to perform a function of quickly heating an outer segment of the melt to a higher temperature.

Hiromi at pages 1 and 2 merely suggests a typical  $T_{\text{melt}}$  range for this polymer of 200-350°C, 100-350°C, and 150-280°C. It appears that temperatures appearing later in the text address MFR or melt index--see the right-hand column of page 3 wherein ASTM methods are indicated.

The Examiner maintained his previous anticipation rejection on the basis that "Hiromi discloses an extrusion assembly having heater (2,4) for heating the polymer to a higher temperature than the  $T_{\text{melt}}$  as indicated in the claim" and further, that Hiromi "teaches that the heater (4) is disposed at the exit end of the extruder for heating a portion of the polymer exiting from the device." Even were it assumed the Examiner was correct, this argument does not pertain to the claims as presently amended. Moreover, Hiromi's drawings fail to show that the heaters (2 and 4) extend to the downstream face of the die.

Since Hiromi does not disclose a die plate or extrusion assembly 1) for preparing solid pellets and 2) having a heater capable of locally heating the melt to a specific temperature range above the  $T_{\text{melt}}$ , as now required by the independent claims, these elements of the claims are missing from the reference. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

### **35 USC 103(a) Rejection Of Claims**

Claims 36-46, 51-61, and 72 were finally rejected as unpatentable over Leffew et al. US 6,409,491 ("Leffew") because Leffew discloses all elements of the die plate and extrusion die

assembly with a heater capable of heating the melt flow to a temperature within the claimed range, the claimed range being a matter of choice and not imparting patentability to the apparatus claim. Applicants respectfully traverse this rejection because, while not taking issue with the legal principle cited, Leffew does not disclose the apparatus element of a heater capable of and positioned so as to heat only locally, a portion of the melted polymer to the newly recited range from 30°-170°C *above* the  $T_{melt}$  or cup temperature of the polymer mass, while the balance of the mass remains at  $T_{melt}$ .

Leffew is concerned with reheating solidified low molecular weight polymer prior to extrusion from a barrel. Leffew is directed to a die plate assembly wherein multiple extrusion barrels are equipped with thermocouples to sense temperature drop *below* the liquid state, a controller to transmit the determination of solids temperature range from the thermocouples, and a heater that reheats the solid polymer in the indicated barrel back to the liquid state. See Leffew at column 3, lines 8-16 ("thereby melting the polymer").

Accordingly, Leffew does not provide a heating means for raising a local area of the polymer flow to a temperature "30-170°C" above  $T_{melt}$ , as required by the present claims. There is no indication in Leffew whether the heaters could heat the polymer beyond  $T_{melt}$  or whether local heating in each barrel can be accomplished. Reconsideration and withdrawal of the rejection in view of the lack of even a suggestion of a heater to locally heat the polymer flow above  $T_{melt}$ , is respectfully requested.

The Examiner maintained his obviousness rejection over Leffew on the basis that Leffew's teaching of a heater having a corresponding extrusion barrel "heated to a predetermined temperature . . . *inherently* suggests . . . the heating means for raising a local area of the material flow to *a temperature above the  $T_{melt}$*  as defined in the claims of the instant application." Emphasis supplied.

Inasmuch as the claims are now limited to apparatus that provide a heating means for raising a local area of the polymer flow to a temperature 30°-170°C *above  $T_{melt}$* , applicants respectfully submit that Leffew's Figure 1 and column 4, lines 14-18, relied upon by the Examiner to maintain this rejection, in no way disclose or suggest the temperature differential characterizing applicants' invention as presently amended. Accordingly, it respectfully submitted

that Leffew fails to disclose or suggest the present invention, and withdrawal of the rejection is therefore respectfully requested.

Claims 47-50, and 62-64 were rejected as unpatentable over Leffew in view of Dudley U.S. Patent No. 4,123,207 ("Dudley"). Dudley, as noted in previous responses does not provide the heating means for locally raising the polymer flow above  $T_{melt}$ , much less to a temperature *30-170°C" above  $T_{melt}$* , as required by the presently amended claims. Accordingly, even assuming *arguendo* that the combination of Dudley with Leffew is otherwise correct, neither of the references disclose or suggest the apparatus heating element of the invention for locally raising the polymer flow to a temperature 30°-170°C above  $T_{melt}$ .

Withdrawal of the foregoing rejections and allowance of the claims are respectfully requested.

#### **New Claims**

New independent claims 73 and 80 are analogous to original claims 36 and 51, respectively, except for the additional limitations that the polymer to be extruded is heated by direct contact between the heating element and the polymer to be extruded and that the heating element is electrical. None of the cited references disclose or suggest both the use of an electrical heating element and direct contact between the heating element and the extruded polymer. The heating means disclosed in the cited references would not be capable of providing the required temperature increase in the extruded polymer at the exit of the die just prior to extruded polymer contacting the cooling medium on the downstream side of the die.

Therefore, allowance of claims 73 - 86 is respectfully requested.

## **CONCLUSIONS**

Having demonstrated that the cited references fail to disclose or suggest the invention as claimed, and all other formal issues having now been fully addressed, this application is believed to be in condition for allowance. Accordingly, applicants request early and favorable reconsideration in the form of a Notice of Allowance.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated, because this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1712 (Docket #: 2003B103/2).

Respectfully submitted,

Date: December 17, 2007

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